

CATHODE FOR HIGH EMISSION X-RAY TUBE

Abstract of Disclosure

A method and apparatus for an x-ray tube having an emitter and a differentially biased emitter-cup cathode configured to provide an electron beam of substantially greater perveance and beam compression ratio than otherwise obtainable with conventional cathode designs is disclosed. The method and apparatus include a cathode assembly opposing an anode and spaced apart therefrom. The cathode is maintained during operation of the x-ray tube at a negative potential with respect to the anode. The cathode assembly includes an emitter for emitting an electron beam to a focal spot on the anode during operation of the x-ray tube and a cathode front member having an aperture defined by the cathode front member on a first side of the emitter. A backing is disposed on a second side of the emitter and is operably connected to the cathode front member via a backing insulator. The cathode further includes a means for applying a differential bias in the cathode assembly to variably change the focal spot size.